

## PATENT SPECIFICATION

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## (54) DETERGENT COMPOSITION

(71) We, UNILEVER LIMITED, a company organised under the laws of Great Britain, of Unilever House, Blackfriars, London E.C.4., England, do hereby declare the invention for which we pray that a patent may be granted to us and the method by which it is to be performed, to be particularly described in and by the following statement:—

The invention relates to a pourable aqueous detergent composition containing suspended particulate matter.

Liquid or pourable gel detergent compositions containing suspended particles have been prepared, but difficulty has been experienced in devising a fluid phase which is not cloudy or opaque and which is capable of suspending the uniformly dispersed particles, without allowing them to separate out on standing.

We have now discovered that by careful selection of ingredients, we can obtain a detergent composition having a clear fluid phase which possesses the desired suspending properties.

Accordingly, the invention provides a pourable aqueous detergent composition comprising a clear fluid aqueous phase having suspending properties comprising from 8 to 50% by weight of an organic detergent active material including at least 2% by weight of the aqueous phase of triethanolamine lauryl sulphate; from 0.5 to 2.0% by weight of a water-soluble polymer of acrylic acid cross-linked with about 1% of a polyallyl ether of sucrose and having an average of about 5.8 allyl groups for each sucrose molecule, the polymer having a molecular weight in excess of 1,000,000; as a clarifying agent, 0 to 30% by weight of a water-miscible organic compound selected from the group consisting of alcohols, glycols and glycol ethers; sufficient of a neutralising agent to adjust the pH of the fluid phase to a value of from 5.5 to 11; and also a separate phase comprising particles of immiscible fluid or solid matter disposed and suspended in the fluid phase.

The clear fluid phase contains from 8—50%, preferably 12—30% by weight of an

organic detergent active material including at least 2% by weight expressed in terms of the aqueous phase of triethanolamine lauryl sulphate. Triethanolamine lauryl sulphate can in fact form the sole organic detergent active material in the clear fluid phase, or it can be supplemented with other organic detergent active materials.

Examples of other organic detergent active materials which can if necessary be used to supplement the triethanolamine lauryl sulphate are anionic surface active agents such as triethanolamine lauryl ether sulphate, ammonium lauryl sulphate and alkanolamine lauryl sulphate such as monoethanolamine lauryl sulphate. This is not intended to be an exhaustive list, but it should be emphasised that if it is intended to select a some cationic or a nonionic detergent active material to supplement the triethanolamine lauryl sulphate, certain of them can form a precipitate or yield opaque systems which detract from the requirement that the fluid phase should be clear.

The composition of the fluid phase should be such that it is capable of suspending the particles of matter in a spatially stable manner for a period of at least 6 months under normal conditions of storage or transport. This can be achieved by the addition of from 0.5—2.0% by weight of a water soluble polymer of acrylic acid cross-linked with about 1% of a polyallyl ether of sucrose having an average of about 5.8 allyl groups for each sucrose molecule, the polymer having a molecular weight in excess of 1,000,000.

Examples of such polymers are Carbopol 934 and 940; the preferred polymer is Carbopol 941, and the ideal concentration in the fluid phase of this polymer at the preferred active detergent concentration is from 0.8—1.0% by weight. Carbopol is the Registered Trade Mark of the B. F. Goodrich Co. Ltd.

Polymers of the type herein defined are normally acidic, and it is necessary therefore to incorporate in the fluid phase sufficient of an alkaline agent to adjust the pH of the clear fluid phase to a value of from 5.5—11 preferably from 6—8. The appro-

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prate quantity of alkaline agent for this purpose can readily be determined by a simple experiment.

Triethanolamine is the preferred alkaline agent but other alkaline agents such as monoethanolamine and sodium hydroxide can be used.

In order further to ensure that a clear fluid phase is formed and maintained, it should also contain from 0—30% by weight of a clarifying agent. The clarifying agent, when present, is a water-miscible organic compound selected from the group consisting of alcohols, glycols and glycol-ethers. The preferred clarifying agent is ethanol which can conveniently and economically be provided in the form of industrial methylated spirit.

The immiscible phase comprising particles of fluid or solid matter which are dispersed and suspended in the clear fluid phase should usually be visually distinct from the fluid phase. For example they may be coloured and have a different repartive index from that of the clear fluid phase. The particles themselves normally have a linear dimension of at least 0.1 mm and usually no greater than 5 mm.

According to one embodiment of the invention, the particles are of fluid or solid matter and are spheroidal in form having a diameter of from 0.1—5 mm. Spheroidal particles of solid matter of the requisite size can be spheroidal capsules which are adaptable to dissolve or disintegrate when the detergent composition is diluted with water. They can be made by any of the known methods such as are proposed in British Patent Specification No. 1,390,503.

According to another embodiment of the invention, the particles are of solid matter and are plate or flake like in form having a major linear dimension of from 0.1—5 mm.

Aqueous detergent compositions according to the invention are prepared by mixing from about 0.1 to about 5% by weight of the immiscible phase with the clear fluid phase.

Other ingredients such as perfumes, colouring agents and foam boosters can also be incorporated in compositions according to the invention.

The invention is illustrated by the following Examples.

#### EXAMPLE 1

A bath additive was prepared as follows:

##### (i) Fluid Phase

A clear fluid phase was prepared by mixing the following ingredients:

	% by weight
Carbopol 941	0.8
Industrial methylated spirits	10.0
Triethanolamine lauryl sulphate	20.0

Coconut diethanolamide	2.0	
Triethanolamine	2.5	
Perfume, colour and water	to 100	65

##### (ii) Particulate Phase

The particulate phase consisted 3 mm diameter spheroidal capsules containing perfume. These were mixed with the fluid phase to provide a 3% by weight dispersion.

The fluid phase of the product so obtained remained clear and did not permit the particles to separate on standing within the temperature range 0°—50°C.

#### EXAMPLE 2

A shampoo was prepared as follows:

##### (i) Fluid Phase

A clear fluid phase was prepared by mixing the following ingredients:

	% by weight	
Carbopol 941	0.9	
n-Propan-1-ol	10.0	
Triethanolamine lauryl sulphate	15.0	
Monoethanolamine	0.9	
Perfume, colour and water	to 100	85

##### (ii) Particulate Phase

The particulate phase consisted of pigmented epoxy resin coated aluminium foil particles. These were mixed with the fluid phase to provide a 0.1% by weight dispersion.

The fluid phase of the product so obtained remained clear and did not permit the particles to separate on standing within the temperature range 0°—50°C.

#### WHAT WE CLAIM IS:—

1. A pourable aqueous detergent composition comprising

- (i) a clear fluid aqueous phase having suspending properties comprising from 8 to 50% by weight of an organic detergent active material including at least 2% by weight of the aqueous phase of triethanolamine lauryl sulphate; from 0.5 to 2.0% by weight of a water-soluble polymer of acrylic acid cross-linked with about 1% of a polyallyl ether of sucrose having an average of about 5.8 allyl groups for each sucrose molecule, the polymer having a molecular weight in excess of 1,000,000; as a clarifying agent 0 to 30% by weight of a water-miscible organic compound selected from the group consisting of alcohols, glycols and glycol ethers; and sufficient of a neutralising agent to adjust the pH of the fluid phase to a value of from 5.5 to 11; and
- (ii) a separate phase comprising particles of immiscible fluid or solid matter disposed and suspended in the fluid phase.

2. An aqueous detergent composition according to claim 1, in which the organic detergent active material also comprises triethanolamine lauryl ether sulphate, ammonium lauryl sulphate or monoethanolamine lauryl sulphate.

3. An aqueous detergent composition according to claim 1 or 2, in which the clarifying agent comprises ethanol (3)

4. An aqueous detergent composition according to claims 1, 2 or 3, in which the neutralising agent is triethanolamine.

5. An aqueous detergent composition according to any preceding claim, in which the particles are of solid matter and comprise

spheroidal capsules which are adapted to dissolve or disintegrate when the detergent composition is diluted with water.

6. An aqueous detergent composition according to any of claims 1 to 4, in which the particles are of solid matter and are plate or flake like in form.

7. An aqueous detergent composition according to any preceding claim and substantially as described in either of the Examples.

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